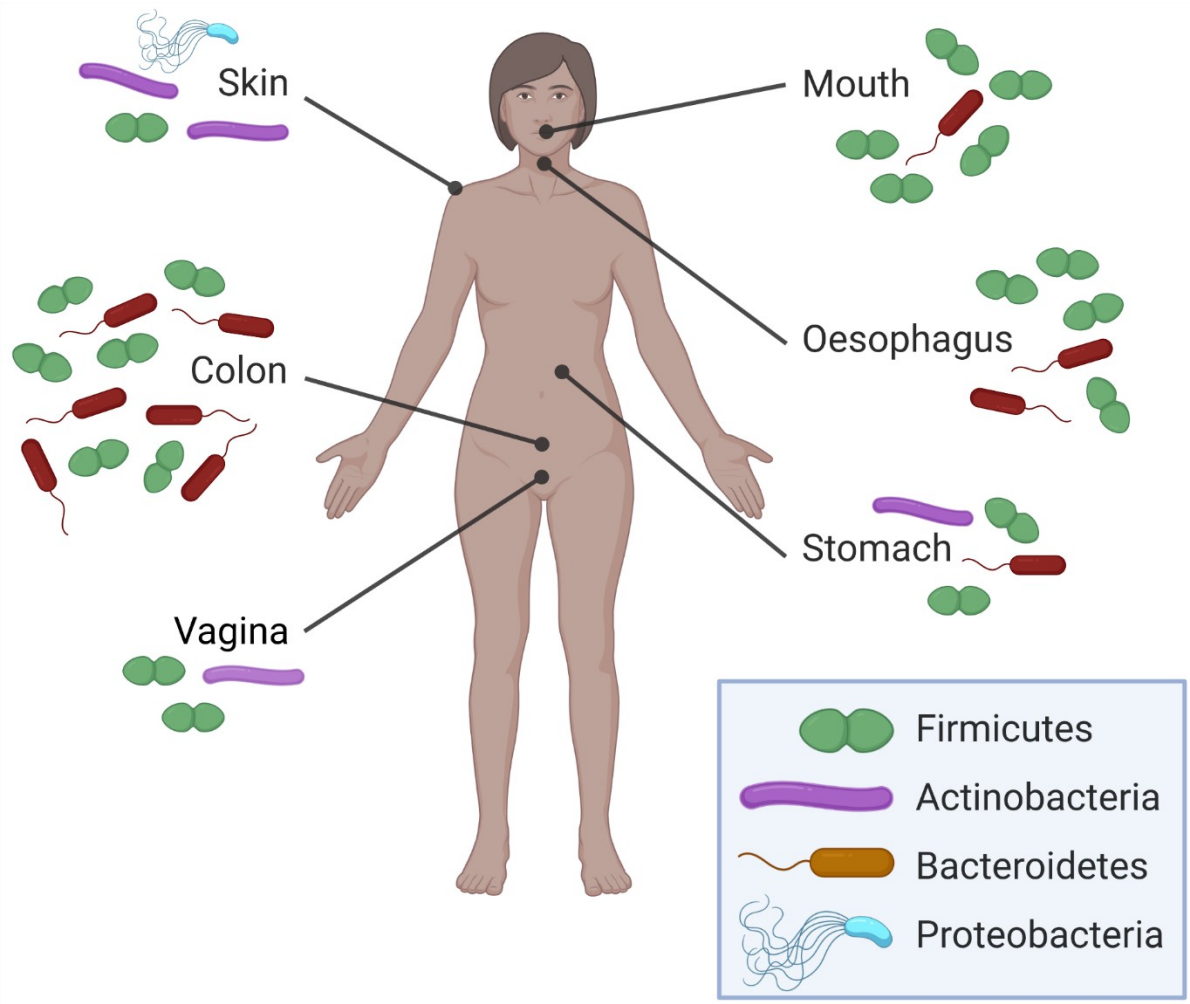
Introduction to programming of innate immunity by the microbiota

To keep pathogens under control, the majority of healthy epithelial tissues (linings of body surfaces) are colonised by a large number of normally non-pathogenic bacterial species - the commensal bacteria or microbiota for short.

These species can produce antimicrobial molecules (e.g., lactic acid made by vaginal lactobacilli) or trigger their production by the epithelial cells.

Microbiota homeostasis can be disturbed by different environmental factors (including antibiotics) or host genetics which leads to dysbiosis and can influence host inflammatory responses.



From top to bottom, the areas of the body are the skin, mouth, oesophagus, stomach, colon and vagina. Four main bacterial types are identified: firmicutes, actinobacteria, bacteroidetes, and proteobacteria. For each area of the body, the type and relative size of the microbiome are represented. The infographic shows the colon as having the largest amount of bacteria present, followed by the mouth, then the skin and

oesophagus, the stomach and finally the vagina with the smallest microbiome. The illustration also shows the proportion of each bacterial type. In the skin, half of the bacteria are actinobacteria. In the mouth and oesophagus, the majority of bacteria are of fimicutes type. In the colon, the microbiota is made of almost equivalent proportion of bacteroidetes and fimicutes. In the stomach, half of the microbiome is made of fimicutes, with some bacteroidetes and actinobacteria. Finally, the vagina mainly contains fimicutes.

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In this section, you will learn more about the relationship between microbiota and the immune system of a host.

Human microbiome

Before moving to the next page, take a closer look at the various commensal bacterial strains colonising different sites of the human body

On the next two pages, you will watch a series of two micro-lectures which explore the details of the interactions between microorganisms and the human immune system.

These micro-lectures are presented by Dr. Thomas Clarke, Royal Society and Wellcome Trust Sir Henry Dale Fellow, MRC Centre for Molecular Bacteriology and Infection, Imperial College London.